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34. The semiconductor laser diode according to claim 24, further comprising an insulator layer disposed adjacent the first conductor layer. --

REMARKS

Applicants thank the Examiner for extending the courtesy of an interview to applicant's representative on December 19, 2002.

Applicants have cancelled claims 1-23 and added new claims 24-31 to be prosecuted in the present RCE application. Claims 24-31 are pending with claim 24 being independent. No new matter has been added. In particular, support for the subject matter claimed in claim 24 exists in the application at Figure 3 (showing a first cladding layer with a ridge, the ridge having a first width; a defined gain region having a second width greater than the first width; and reduced conductivity regions flanking the defined gain region) and in the specification at page 11, line 21 to page 12, line 1 (stating that in an embodiment of the invention, only sections of the active layer on the sides of the ridge are implanted with high energy protons to produce reduced conductivity regions). Support for the subject matter claimed in claims 28 and 29 exists in the application at page 12, line 21 to page 13, line 5.

35 U.S.C. § 102

Claims 1-8 and 10-11 have been rejected as allegedly anticipated by Nagai et al. (U.S. Patent No. 5,960,020). Applicants request that this rejection not be applied to the new claims because Nagai does not disclose or suggest the subject matter of independent claim 24.

Independent claim 24 recites a semiconductor laser having a first cladding layer with a ridge and an active layer with a defined gain region and reduced conductivity regions flanking the defined gain region. The ridge has a first width at the bottom of the ridge and the defined gain region has a second width greater than the first width.

Nagai does not disclose or suggest a semiconductor laser with reduced conductivity regions that define a gain region in the active layer with a second width greater than the first width of the ridge. Nagai relates to semiconductor lasers operating near threshold current. Nagai is concerned with stabilizing the horizontal transverse mode of the laser, *see* col. 2:20-37, and, more particularly, with reducing the kink in the intensity-current curve that appears near

threshold current, *see* col. 8:17-46. Nagai states this can be achieved by reducing the width of the ridge preferably to not more than 3 microns (col. 2: 33-37). However, according to Nagai in practice such a width cannot be fabricated because it would result in a ridge having triangular shaped ridge with not top surface on which to apply a conductive layer, so, Nagai states, “[a]ccordingly, it is impossible to prevent a higher mode from being generated and to stabilize the horizontal transverse mode by reducing the width of the ridge waveguide” (col. 2:38-53). Therefore, Nagai discloses a ridge waveguide semiconductor laser with disordered regions defining an opening in the active layer that is significant narrower than the width of the ridge (*See*, Nagai Fig. 3; col. 4:37-54; col. 7:6-22). These disordered regions that extend under the ridge achieve Nagai’s goal.

In contrast, the claimed invention has a defined gain region in the active layer, which is wider than the width of the ridge. The reduced conductivity regions do not substantially affect desired modes lasing in the gain region, but impede the gain of light in undesired modes which have a greater horizontal extent than desired modes and would propagate in portions of the active layer flanking the defined gain region. Thus, desired lateral modes (e.g., the fundamental mode) may be supported, while undesired modes (e.g., higher-order modes) may be suppressed.

For at least these reasons, applicants request allowance of claim 24. Claims 25-34 depend from claim 24 and are allowable for at least the reasons that claim 24 is allowable and for containing allowable subject matter in their own right.

35 U.S.C. § 103

The Examiner has rejected dependent claim 9 as allegedly obvious over Nagai in view of Nagai et al (U.S. Patent No. 5,467,457).

Applicants request that this rejection not be applied to any of the new claims because neither Nagai reference, alone or in combination discloses or suggests the subject matter of claims 24-34.

New dependent claim 32 is similar to dependent claim 9 and depends from claim 24, which is allowable for at least the reasons explained above. Thus, claims that depend from claim 24 are allowable for at least the reasons explained above.

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CONCLUSION

Applicants asks that the Examiner consider all references cited in the concurrently filed Information Disclosure Statement. Applicants ask that all claims be examined and allowed. Enclosed is a check for \$110.00 for the Petition for Extension of Time fee. Please apply any other charges or credits to Deposit Account No. 06-1050, referencing Attorney Docket No. 14564-011001.

Respectfully submitted,

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